

- Mjöberg, E. 1925. A new genus of sucking lice. *Psyche* 32: 283-284.
- Qadri, M. A. H. 1948. in Mirza, M. B. (ed.), *On Indian Insect Types*. Aligarh Muslim Univ. Publ. (Zool. Series). I. External and internal anatomy of the buffalo-louse, *Haematopinus tuberculatus* Burmeister, pp. 1-21, pls. I-IX.
- Simpson, G. G. 1945. The principles of classification and a classification of mammals. *Bull. Amer. Mus. Nat. Hist.* 85: i-xvi, 1-350.

NOTES ON SOME ROGADINE GENERA

(HYMENOPTERA: BRACONIDAE)¹

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ABSTRACT—The present status of the genus *Rogas* is discussed. *Bracon gasterator* of Jurine is redescribed. *Aleiodes* and *Heterogamus* are removed from *Rogas* and the characters of the generic types given. Features of *Cystomastax*, *Megarhogas*, *Macrostomion* (including *bicolor*) are stated, being based upon examination of the type specimens. *Acauthorhogas*, *Brachycentrus* Szépligeti 1907, *Neoclinocentrus*, *Semirhytus* and *Mesocentrus* are removed from the Rogadinae and their characters as represented in the types are reviewed.

The braconid subfamily Rogadinae was formally recognized as a distinct entity within the cyclostome section by Förster in 1862 when he designated the group as the "Family Rogadoidae." In 1836 Haliday had used the name *Rogas* Nees von Esenbeck in a very broad sense, including as subgenera *Spathius* Nees, *Doryctes* Haliday, *Heterospilus* Haliday, *Hecabolus* Haliday, *Chremylus* Haliday, *Hormius* Nees, *Rhyssalus* Haliday, *Colastes* Haliday, *Clinocentrus* Haliday, *Rogas* and *Ademon* Haliday. Förster regarded these as distinct genera and relegated most of them to other "Families," including in the Rogadidae only *Petalodes* Wesmael, *Pelecystoma* Wesmael, *Ademon*, *Clinocentrus* and *Rogas*. The subfamily has been treated in various ways by subsequent authors. Some have recognized Rogadinae, Exothecinae, Rhyssalinae, Pambolinae, Hormiinae, Spathiinae and Doryctinae as

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being distinct. Others have combined these in various ways and have proposed numerous arrangements, the limits of the subfamily Rogadinae "wandering" as different opinions of relationships have been expressed and different relative weights given particular features. At present there appear to be approximately 68 genera included in the tribe Rogadini and about 27 in the combined Hormiini-Pambolini.

Many of the "genera" contain species or groups which are discordant and one of the major difficulties confronting us is what to do with the overabundance of differences. Much redefining and realignment of the genera now included in Rogadinae appears to be necessary. Even the subfamily or tribal limits are still far from being defined (or definable in our present state of knowledge) and every character thus far used to segregate the group appears to break down. *Ademon* has been shifted back and forth between the Opiinae and the Rogadinae so even the cyclostome feature is not always as evident as one might wish. Actually, the only character which I have found which appears to be reliable for separating the Cyclostomi from other braconids is that the labrum is concave on the front side in the cyclostomes—but perhaps this also is a purely artificial segregant.

Because ideas of classification vary with the point of departure and depend so greatly upon definition we have a most confusing picture in many groups of insects. What at first appears to be clear-cut and authoritative is found upon closer examination to be vague, overlapping, arbitrary, and perhaps even misleading. This is as true in the Braconidae as in other insect groups. For example, if one assumes that the braconids are descendent from sawflies, or a sawfly-like ancestor, then the braconid most like the sawfly ought to be the most primitive (plesiomorph, if you wish). This group would perhaps prove to be the Ichneutinae, which have a biological association as well as many morphological similarities with some sawfly groups. Assuming the Ichneutinae to be the starting point, we would proceed to build thereon an entirely different type of classification than we would if we assumed the more primitive braconid to have been cyclostome with non-margined head, sessile abdomen, long ovipositor and without chaetobothria on the tibiae.

Classification of the family is also made difficult by the fact that the earlier arrangements were developed to fit material mostly from a limited area and we have been trying to force groups from elsewhere into this format. In addition, many of the early established genera were very incompletely delimited, being characterized in a sentence or two only. Lack of information in print regarding the various characters possessed also makes it very difficult for one to try to assess the status which should be assigned.

The relatively recent procedure involving dependence on types to

give firm associations of names with specimens bearing particular features has created a few problems but many advantages. Often when type specimens have been looked at carefully it has been discovered that names were wrongly applied and this in turn has affected the apparent content within suprageneric categories. As the features of the types have become known it has been possible to redefine and to bring taxa into what appear to be more adequately expressed systems of plausible relationship. Among those who have been active in clearing up misconceptions through such means, perhaps no one has contributed more than Mr. Muesebeck. Not only has he examined a great many types but he has long encouraged others to look at them in groups not well understood and has guided the activities of many young entomologists with regard to parasitic Hymenoptera and other insects.

It has been my good fortune to have had Mr. Muesebeck's counsel and to be able to examine the type specimens of the genotypic species for several of the so-called Rogadine genera and the following descriptions and notes are offered to help in recognition of members belonging to them and to remove some from the Rogadinae. It has also seemed desirable to point out certain problems that need to be solved.

Rogas Nees von Esenbeck

Rogas was established in 1818 by Nees von Esenbeck (*Nova Acta Acad. nat. Curios.* 9: 306). In his original treatment he included three divisions involving 26 species, of which he mentioned seven by name. Of the seven, the two in the first division were early transferred to *Macrocentrus* and the one in the third to *Ademon*. The four names given in the second division were, in sequence, *Bracon gasterator* Jurine, *Bracon bicolor* Spinola, *Bracon testaceus* (of Spinola. See p. 34 of Nees von Esenbeck's (1811) 1812 paper which he cited) and *Bassus testaceus* Fabricius.

What Nees von Esenbeck had in mind as *Bassus testaceus* Fabricius in 1818 is difficult to say, but in 1834 (*Hym. Ichn. affin. Mon.* 1: 218) he used the new name *Rogas luteus*, giving as synonyms *Ichneumon testaceus* Fabricius (1798 *Suppl. Ent. Syst.*: 228) and *Bassus testaceus* Fabricius (1804 *Syst. Piezat.*: 101). Perhaps the name *luteus* was created so that there would not be two species of *Rogas* bearing the specific name *testaceus*. *Rogas luteus* Nees von Esenbeck was included in *Pelecystoma* by Wesmael in 1838 (*Nouv. Mém. Acad. Sci. Brux.* 11: 92) and was designated as the type of that genus by Förster in 1862 (*Verh. naturh. Ver. preuss. Rheinl.* 19: 240). According to Zimsen (1964 *Type Material Fabricius*: 371) there are two specimens (cotypes) of *Ichneumon testaceus* Fabricius in Kiel and Townes (1965 *Polskie Pismo ent.* 35: 412) stated that the species is braconid.

Rhogas is an emendation of *Rogas* which was made by Marshall in 1868 (Entomologist's mon. Mag. 4: 260).

Materials bearing upon the designation of a species to serve as the generic type for *Rogas* are as follows:

In 1829 Stephens (Nomencl. Br. Insects: 32) included only *Rogas testaceus* Fab.

In 1833 Haliday (Ent. Mag. 1: 266) under *Rogas* included *Rogas testaceus* Nees, giving as synonyms *Bassus testaceus* Fab. and *Bracon testaceus* Spin. [That *Bracon testaceus* differed from *Bassus testaceus* was indicated by Spinola in his description of the former. Nees von Esenbeck in (1811) 1812 (Mag. Ges. nat. Fr. Berl. 5: 34) did not include *testaceus* of Fabricius as a synonym (and, judging from his figure, the species involved is not the same as *Bracon gasterator* Jurine)]. Neither did he include *Bassus testaceus* Fabricius as a synonym of *Rogas testaceus* in 1834 (Hym. Ichn. affin. Mon. 1: 215).

In his discussion of the genus *Rogas* s.l. in 1834 Nees stated "Character naturalis (a *Roga annulicornis* derivatus).", but *annulicornis* was not among the species named in 1818 and furthermore belongs to his section I which was later transferred to *Macrocentrus*. He included nine species in Sectio I, 17 in Sectio II, and two in Sectio III in 1834. His Sectio II he designated as "Gasteratores" but "Character naturalis (a *Roga luteo* derivatus)" (p. 206). *Rogas luteus* however was not among the names originally given. In this work he indicated that varieties I and II of Spinola's *Bracon gasterator* were not the same as Jurine's species and renamed them *Rogas reticulator*, leaving only Spinola's Var. III as *gasterator*.

Curtis in 1834 (Brit. Ent. 3: No. 512, under *Rogas balteatus*) wrote "Type of the Genus *Bassus testaceus* Fabr." but characterized the genus by dissecting and describing *Rogas bicolor* Spinola.

Haliday 1836 (Ent. Mag. 4: 96) under *Rogas (Rogas)* lists "*Rogas*, Sect. II. *Gasteratores*." On p. 101 he treats *Rogas testaceus* (no. 31) which he credits to Nees von Esenbeck 1834 (Hym. Ichn. affin. Mon. 1: 215) (but Nees is here discussing Spinola's species. *Testaceus* of Haliday was later synonymized with *Rogas circumscriptus* of Nees von Esenbeck by Marshall in 1885). Haliday held *gasterator* separate as no. 27. On p. 104 he wrote that *Rogas luteus* is probably *Bracon bifasciatus* Spinola and that it is hardly acceptable in *Rogas* s.s. because of the long ovipositor.

Haliday (1839) 1840 in Westwood (Introd. mod. Class. Insects 2 Synops.: 64) gives *Bracon gasterator* Jurine as type.

Blanchard 1840 (Hist. nat. anim. articulés 3: 342) re *Rogas*, "Le type du genre est le 1. *Rogas gasterator* Jurine."

Brullé 1846 in Lepeletier (Hist. nat. Insectes, Hym. 4: 473), "Le

type est le *Bracon gasterator* (Jurine), qui appartient à la deuxième section des *Rogas* de M. d'Esenbeck."

Förster 1862 (Verh. naturh. Ver. preuss. Rheinl. 19: 240), "Typ. *Rog. circumscriptus* Nees." (Not originally included).

Viereck 1914 (Bull. U.S. Nat. Mus. 83: 130) transferred *Rogas* to Ichneumonidae as (= Alexeter Förster) and used *Aleiodes* as a substitute for *Rogas* with *Aleiodes heterogaster* designated as type.

Brues 1926 (Proc. Am. Acad. Arts Sci. 61: 380), "*Rhogas* Type: *R. heterogaster* Wesmæl." (Not originally included in *Rogas*).

Fahringer 1931 (Opusc. Bracon. 3(3): 216), *Rhogas* (*Rhogas*) "Subgenotype: *Rhogas dimidiatus* Spin." (Not originally included).

Muesebeck 1931 (Proc. U.S. Nat. Mus. 79(16): 13), "Genotype: *Bassus testaceus* Fabricius."

Watanabe 1937 (J. Fac. Agric. Hokkaido (Imp.) Univ. 42(1): 51), "Genotype—*Rhogas dimidiatus* (Spinola)."

Telenga 1941 (Faune SSSR 5(3): 137), Type for genus = *Bracon dimidiatus* Spin.

Hincks 1943 (Entomologist 76: 222) stated that *Bassus testaceus* was not really included in the original article and that Curtis' selection was therefore invalid. He indicated that Förster's designation of *Rogas circumscriptus* was invalid because the species was not among those listed originally and he designated as type *Bracon gasterator* Jurine, apparently being unaware of the designations made by Hali-day, Blanchard and Brullé.

Muesebeck & Walkley 1959 (Agriculture Monogr. 2: 170), "Type: *Ichneumon testaceus* Fabricius. Design. by Curtis 1834."

From the history it is evident that *Ichneumon testaceus* Fabricius must be accepted as the generic type for *Rogas* under the provisions of Articles 67-69 of the International Code unless suspension of the rules is obtained. If it should be decided that Curtis' designation of *Bassus testaceus* Fabricius should be disregarded, then the logical substitute would be *Bracon gasterator* Jurine.

Not so evident is the group of insects to which the name *Rogas* must be applied. If Nees von Esenbeck's synonymy of *Ichneumon testaceus* Fabricius with *Rogas luteus* is correct then what we have been calling *Pelecystoma* will have to be called *Rogas* and a new name will have to be found for what we know at present as *Rogas*. That neither *Heterogannus* nor *Aleiodes* should be used for what is now thought of as *Rogas* will be shown under treatment of those names. The matter cannot be settled until somebody has the opportunity to restudy carefully the Fabrician types, designate the lectotype and give its features. Apparently *testaceus* has not been redescribed since Fabricius indicated that it was of medium size; yellow, with wings hyaline and stigma yellow; with abdomen ovate, depressed, and segments distinct.

Because of the importance of this question in establishing the primary features of the subfamily Rogadinae it appears that for the present it is best merely to give features of the type specimens as quickly as this can be done. Therefore a start towards accomplishment of this objective is made in this paper. *Bracon gasterator*, which may be left in *Rogas* for the present, is also characterized.

Bracon gasterator Jurine

Jurine listed the name *Bracon gasterator* in 1807 in his Nouvelle Méthode de Classer les Hyménoptères et les Diptères vol. 1: 118 as a ♀ and indicated that it had been illustrated. The colored figure was presented in Plate 8 where there is shown a general dorsal view, an antenna and a mandible (the central mandible is that of *Alysia manducator*—see p. 118). The ♀, ♂ and three varieties were described by Spinola 1808 (Insect. Liguriae 2: 121). Nees von Esenbeck recharacterized *gasterator* in 1834, changing the status of Spinola's varieties I and II to that of a different species (*Rogas reticulator*) and limiting *gasterator* to variety III. This change was accepted by Haliday 1836 and has been followed since.

In the Jurine Collection at the Muséum d'Histoire Naturelle at Genève there is a unique ♀ bearing the labels "*gasterator* J.," "18," and "*Bracon gasterator* Jur. Coll. Jurine." The following notes are based on this specimen.

Length: 8.8 mm. Head + thorax 4 mm. Forewing 5.5 mm.

General color: Head dark with genae and face deep reddish-brown. Mandibles red except black apices. Thorax black except reddish metapleurae and part of mesepisternum below scrobe. All coxae and legs red with tibiae more of a light reddish brown; tarsi reddish. Abdomen red except apical segments which are black. Tegula red.

Head: Antennal scrobes weakly impressed, immargined, with strong arched rugae. Distance from antennal orifices to rim of clypeus 4, across face at lower edge of antennal orifices 6.7. Malar space $\frac{1}{2}$ shorter than base of mandible and nearly half ($\frac{5}{11}$) of eye height. Groove from median ocellus between antennae over prominence and $\frac{1}{3}$ of way down face. Face irregularly rugoso-punctate. A carina along the emarginated portion of the eye. Distance between anterior tentorial pits twice height of clypeus and $\frac{2}{3}$ longer than tentorio-ocular line. Mouth opening large, as wide as distance between anterior tentorial pits. Eye broadly and shallowly emarginate at level of antenna, oval in side view, with interfacetal hairs which are quite distinct and which give the appearance of sparse hairiness to the eye when it is examined under magnification. Temples slightly narrower than eyes. Vertex rugose anteriorly, the rugae extending onto the stemmaticum which is not distinctly set off from the rest of the vertex. Vertex behind lateral ocelli punctate, with longer and denser hairs and sloping downward at an angle of about 35° to the carina as seen from the side. Occipital carina very narrowly broken in center above where it is joined by a slight depression running back from the ocelli, the carina lower along the top than along

the sides, not joining the hypostomal carina. Middle ocellus same size as lateral. Diameter of lateral ocellus 10, postocellar line 12, lateral ocellar line 11, ocellocular line 16 and ocelloccipital line 19. Scape $1\frac{2}{3} \times$ as long as thick, inner side nearly straight, outer convex; pedicel half as long as flagellar segment 1 which is longer than wide and longer than segment 2, segment 4 as broad as long. Mandible with two large distinct teeth and a small third tooth, with a strong ridge at the level of the hypostomal carina.

Thorax: Pronotum not grooved transversely on dorsal, central portion. The anterior rim of this part is narrowly reflexed, and crenulate. The grooves on the sides not meeting above, sides with a reflexed rim, coarsely wrinkled. Mesonotum with notaulices distinct; the median lobe only a little protuberant, declivous anteriorly at about a 60° slope, the angle formed by middle lobe and pronotum about 170° , i.e., a very slight change in direction. Mesonotum punctate with smooth spaces between the punctures about $2 \times$ the diameter of the punctures, on posterior half in middle the punctures larger and more elongated. Entire median lobe quite evenly covered with hairs, no median line evident. Notaulices (pre-scutal sutures) rather fine, becoming sharply impressed at about $\frac{1}{3}$ of their length. Lateral lobes hairy and sculptured like the antero-lateral part of median lobe. Scutellum rather flat, punctate, hairy, with a marginal lateral carina extending about $\frac{2}{3}$ of the way along the side, the punctures evenly distributed, smooth between. Mesopleuron with a broad, nearly complete, rugose sternaulus, polished above and below the deep episternal scrobe; area in front of scrobe finely punctate. Deep pits at anterior end of sternaulus just behind epicnemial carina, the latter very distinct and with a deep groove behind its dorsal part. Above, from the subalar pit, a very distinct ridge runs backward which is highest and nearly overlapping (like a wave crested and just beginning to fall) below the tegula. The episternaulus is thus very well developed and is coarsely rugose. Epicnemium finely punctato-striate. Propodeal spiracle round, located at basal third. Propodeum with dorsal face indistinctly grading into the slightly concave posterior face, with a complete median carina and with costa lateralis present; the concave posterior portion traversed by three carinae on each side.

Wings: Radius not reaching wing apex, radial cell less than $2 \times$ length of stigma. Outer margin of stigma $\frac{1}{3}$ longer than inner. First abscissa of radius 4, second 8, third 11; first intercubitus 5; second intercubitus subequal with first. Medius sinuate, curved downward then up to join basal; basal convex anteriorly; first abscissa of cubitus curved; second abscissa $\frac{1}{3}$ length of first intercubitus. Recurrent joining first cubital cell; second cubital cell forming a parallelogram, with both intercubiti sloping outward anteriorly. First brachial cell as long along brachius as second cubital along cubitus. Nervulus postfurcal by $1\frac{1}{2} \times$ its length, a little diagonal, upper inner angle of brachial cell approximately 70° . Subdiscoideus emerging at lower third of apex of brachial cell. First discoidal cell petiolate, the upper abscissa of the basal about as long as parastigma is wide. Posterior wing with radiellian distinct; radiellian cell gradually widening to apex where it is $2 \times$ as wide as near base; postnervellus distinct; mediella about $\frac{1}{4}$ longer than lower abscissa of basella which in turn is $\frac{1}{4}$ longer than the diagonal upper abscissa.

Legs: Trochanters longer than trochantelli on first and middle legs and subequal on hind leg. Posterior coxae punctate; towards the base above and on the proximal half of the outer surface the punctures are elongate and the sculpture

becomes somewhat punctato-rugose. Posterior tibial spurs straight, pubescent; the inner spur about $\frac{2}{5}$ the length of the posterior basitarsus. Larger setae occur at apices of some tarsal segments, e.g., there are 3 large amber-colored setae at the apex of the posterior basitarsus which are much more solid and larger than the "hairs"; two occur on the second segment of the hind tarsus. Claws pectinate. Anterior claw with 6 teeth, teeth 1 and 2 longer and more sloping towards apex, the third shorter and nearly perpendicular, finally a group of 3 small teeth which seem to be fused except at the apices, the base of this compound structure touches the base of tooth 3. Long hairs arise from each side of the middle line. (Claws of hind legs not on specimen.) The claws are as long as the arolia.

Abdomen: Elongate oval with 8 segments visible; lengths and breadths at apex as follows: 1—63:67; 2—46:73; 3—36:70; 4—20:58; 5—15:45; 6—10:33; 7—6:22; 8—5:14. Length of suturiform articulation 3, i.e., it is quite narrow and is shallow but crenulate, curved forward at the sides and slightly so in the middle area. Segments 1 and 2 longitudinally rugoso-reticulate striate. Median carina complete on 1 and extending nearly the length of 2. Tergite 3 striate on basal third, with the striae forming concentric half-circles around the center of the base, the arcs being broken behind when they become too large and the diagonal direction becoming less and less towards the sides. Remainder of abdomen smooth and polished, with scattered light hairs and fine punctures.

The first tergite is massive, so strongly arched lengthwise that the polished anterior face is nearly perpendicular, with strong ear-like lobes at the sides of the front and robust arms to a "Y" of which the stem is the median carina. Between the smaller striations or net-work of ridges there is no fine sculpture. The tergite is a little raised in the middle of the apex and depressed outside of this middle bulge. The central bulge acts as an area for abutment of the second tergite. On tergite 2 the usual triangular central basal boss has become so greatly extended laterally that it reaches all the way to the sides, forming with the median carina a broad T. This raised basal boss evidently works against the first tergite. The second tergite articulates below the first tergite on the sides. Between the two tergites there is a deep V-shaped trough centrally which becomes shallower and eventually disappears near each side. (The broad strong boss is shown in Jurine's drawing.) Tergites 1-3 are margined laterally. The ovipositor has a length of 30 (same scale as used for segments) and is ovate in cross section. There is no notch, but a slight bulge occurs on top near the apex just before the reduction in depth to form a point begins. The sheaths are wanting on the specimen.

Aleiodes Wesmael

In 1838 Wesmael (Nouv. Mém. Acad. Sci. Brux. 11: 94) proposed the name *Aleiodes* for Section II of Nees von Esenbeck's genus *Rogas* and included therein 18 species. He stated that he had earlier designated the group as *Schizoïdes*. Haliday (1840 in Westwood: Introd. mod. Class. Insects 2 Synops.: 64) placed Wesmael's name as a synonym of *Rogas* and it has been treated since as such.

Wesmael presented a key with two major sections, A and B, with B including only *Aleiodes* (*Heterogamous*) *crypticornis*. Under section A he took out *Aleiodes heterogaster* first on the basis of the third

abdominal tergite being as long as the second and only the first two segments being margined laterally. In 1914 Viereck (Bull. U.S. Nat. Mus. 83: 7) designated the first named under section A, *Aleiodes heterogaster*, as the generic type.

Aleiodes heterogaster Wesmael

Wesmael had a single ♀ from the vicinity of Charleroi and a ♂ from near Liège. The ♀ is hereby designated to serve as the lectotype. It bears the following labels: "c," "A. heterogaster ♀ mihi 1.," "Coll. Wesmael," "A. heterogaster mihi Det. C. Wesmael," "RDS Slide 61-77," "2870-RDS," and "lectotype RDS v. 30. '67." The type is in Brussels.

In the lectotype the occipital carina is interrupted above and joins the hypostomal carina on each side below; there is no sternaulus evident and the mesopleuron is mostly shining; the eyes are large, excavated opposite the antennal bases and have only a few fine interfacetal hairs, appearing glabrous; the mouth opening is about half as wide as the distance between the eyes across the anterior tentorial pits; and the last flagellar segment bears an off-center tooth-like projection at its apex. The scrobe is margined and there are shallow groove-like depressions above the anterior tentorial pits which run upwards towards the emarginations of the eyes. The ocelli are moderate in size, with distinct cicatrices, with the greatest diameter of a lateral ocellus $2.3 \times$ as great as the length of the ocellocular line. In front of the anterior ocellus there is a pit. A groove between the lateral ocelli is continued backwards and broadens into a shallow depressed area which extends onto the occiput. The occiput is distinctly concave as seen from above.

Head width 47, length 27, width across back 35—the temples receding gradually, interocular line 23, facial line 16, eye height 30, eye width 18, temple length (ant.-post.) 6. Malar space $\frac{1}{6}$ of eye height, $\frac{2}{3}$ basal width of mandible.

Maxillary palpus 6-segmented, with segments 3 and 4 a little flattened, 3 with the greatest diameter; lengths 3,5,12,12,10,10. Labial palpus 4-segmented with no segment dilated; lengths 3, 5.2, 4.5, 6. Teeth of mandibles horizontal when mandibles are closed, i.e., mandibles twisted so the posterior tooth lies directly posteriorad of the larger upper tooth.

Pronotum separated from mesonotum by a lunate crevice. Central part of pronotum not excavated but with a short recurved rim anteriorly, in lateral profile forming an obtuse angle of about 150° with the nearly perpendicular front of the mesonotum. Scutellum nearly flat in profile, not margined laterally beyond the basal third. Propodeal spiracle oval, located at $\frac{1}{3}$ distance from the front. Propodeum with a complete median carina and convex in profile.

Claws shorter than arolium and simple; trochanters longer than trochantelli; posterior tarsal spurs straight, pubescent, tapering to apices, inner $\frac{2}{3}$ the length of the basitarsus; tarsal segments without large spine-like hairs near apices. On hind tarsus segments 1 and 2 with a lamellate-like row of almost solid pectens on the underside.

Nervulus in forewing postfurcal by $1\frac{1}{4} \times$ its length, oblique outwardly and curved before it joins submedius. Basal vein stronger than other veins and slightly curved; second cubital cell $1\frac{1}{2} \times$ as long along cubitus as length of first

intercubitus. First intercubitus nearly $2 \times$ as long as second; recurrent entering first cubital cell at a point $\frac{1}{3}$ of length of first intercubitus from the fork; first brachial cell $2 \times$ as long as high; outer margin of stigma $1\frac{1}{2} \times$ as long as inner. In hind wing radiellian is slightly sinuate; the radiellian cell very slightly constricted, as wide near base as near apex; mediella $1.6 \times$ as long as lower abscissa of basella which is in turn equal to length of diagonal abscissa; postnervellus absent.

Abdomen with 9 segments visible. Tergites 1, 2 and basal $\frac{1}{4}$ of 3 longitudinally aciculate, with the bottoms of the grooves shagreened. Median carina on tergite 1, 2, across suturiform articulation and about $\frac{1}{6}$ of distance along tergite 3. Tergites 1, 2 and basal $\frac{1}{5}$ of 3 with lateral marginal carina. Suturiform articulation narrow, shallow, crenulate. A lunule present on 3 at $\frac{2}{3}$ of the distance from front to back and $\frac{1}{8}$ of the tergite width from the side. Tergite 2 raised centrally, with a broadly triangular boss and also raised at the anterior corners so as to abut against tergite 1. Abdomen broadest at tergite 3, broadly sessile, pointed at apex, faintly shagreened beyond basal aciculation.

The δ agrees well with the lectotype except that segment 2 of the maxillary palpus is securiform, the body is less boldly reticulate-rugose, the aciculation at base of abdomen less pronounced and the suturiform articulation is relatively a little deeper.

Heterogamus Wesmael

Heterogamus was described in 1838 (Nouv. Mém. Acad. Sci. Brux. 11: 120) as a monobasic subgenus of *Aleiodes*, the type being *Aleiodes* (*Heterogamus*) *crypticornis*. Wesmael pointed out that the second cubital cell is short, that in the female the abdominal segments beyond the third are telescoped so that they are hidden by the third and that in the males the antennae are unusually slender. Wesmael's *crypticornis* has long been recognized as a synonym of *Rogas dispar* Curtis, apparently first being synonymized by Reinhard in 1866 (in Taschenberg: Hym. Dtls: 89).

Since Wesmael's name *Aleiodes* was proposed for the second section of *Rogas* Nees von Esenbeck, which is the section now recognized as *Rogas*, Wesmael was in effect treating *Heterogamus* as a subgenus within this section. Haliday (1836 Ent. Mag. 4: 103) segregated *dispar* into a section (AA) of *Rogas* (*Rogas*) on the basis of the short second cubital cell.

Marshall (1885 Trans. R. Ent. Soc. Lond. 1885: 86) treated *Heterogamus* as a distinct genus but stated, "This genus is not of equal value with the other genera of the present subfamily." Since that time *Heterogamus* has been placed in and removed from *Rogas* by various authors and has been used to include quite different things.

Heterogamus crypticornis Wesmael

Having had the opportunity to examine the types of Wesmael's *crypticornis* through the kindness of Mr. Collart, a lectotype may be

selected and attention called to a number of features which appear to be sufficiently distinctive to justify the retention of generic status for *Heterogamus*. Wesmael had 6 ♀♀ and 8 ♂♂. Except for one pair sent to him from near Liège by Carlier, he had collected the specimens from the vicinity of Brussels. A ♀ bearing the labels "A. crypticornis," "14 Aout:Ag. doit 2" (possibly cloit), "Coll. Wesmael," "A. crypticornis det. C. Wesmael," "2873-RDS," "RDS Slide 61-79" and "lectotype" is hereby designated as the lectotype. It is housed in Brussels.

The head differs strikingly in configuration from that of *Aleiodes heterogaster*, being relatively longer. Width 34, length 28, interocular line 20, facial line 15. Eyes relatively small and hardly emarginate opposite antennal bases. Eye height 18; malar space 9, eye width 13, temple 7. Temple distinctly curved in outline as seen from above and the occiput not concave. Occipital carina complete above, joining hypostomal carina below. Ocelli relatively small; diameter of lateral ocellus $\frac{2}{3}$ length of ocellular line and $\frac{1}{2}$ length of ocelloccipital line; ocelli without cicatrices. Stemmaticum coriaceous, sunken in middle. Scrobes hardly impressed, not margined, rugoso-reticulate with some stronger carinae. Clypeus strongly arched upward into face, its height nearly equal to distance between anterior tentorial pits, rather weakly reflexed below, the angle between the upper and lower portions about 30°. Tentoro-ocular line approximately equal to distance between anterior tentorial pits. Genae rounded. A central carina runs forward from head margin about halfway to postocellar line. Cutting edge of truncate inner tooth of mandible at approximately a right angle to apical tooth, the mandible deeply concave between. Antennae with a pale band beginning at about $\frac{1}{3}$ their length and occupying 8 segments (the two at the extremes of the band partially pale, partially brownish).

Central portion of pronotum with a distinct, slightly-reflexed-upward, concave (but in general horizontal), longitudinally rugose area which occupies about $\frac{1}{4}$ of the length. Behind this ledge there is a ridge (crista?) which rises almost vertically to a rounded central area. At the sides, behind the ledge, there is an impressed area followed by a flaring rounded region, giving a sinuate appearance to the side edge as seen from above.

On the mesothorax the notaulices are weakly impressed except in their anterior fifth and the median lobe is not protuberant. The scutellum is nearly flat and fully margined. The mesopleuron has a complete sternaulus with a sharp margin delimiting it above, a few cross ridges but not crenulate, with sternaular hairs which are about as long as the depth (dor.-vent.) of the sternaulus.

The propodeum has definite dorsal, lateral and posterior faces and is separated from the metathorax by a deep transverse groove; spiracle small, round, located $\frac{1}{4}$ of distance from front of propodeum; dorsal face slightly arched, reticulate-rugose with scattered short hairs which are about $\frac{1}{3}$ the length of those on the sides; with a median longitudinal carina; dentiparal tubercles prominent with a carina extending anteriorly from each; posterior face formed by a central and two lateral impressed areas; sides declivous at about 80°.

The legs possess some unusual features. In all three pairs the trochantellus is longer than the trochanter, this being especially striking in the hind leg where the trochantellus is about 2× as long as the trochanter and is depressed at about

$\frac{1}{3}$ of its length from the trochanter. The claws are as long as the arolium and are not pectinate but each bears a slight bump near the base from which large hairs arise. The posterior coxa is at least twice as long as thick, is transversely ridged above and diagonally so on the outer aspect. The posterior tibiae are pubescent, straight and only about $\frac{1}{4}$ the length of the posterior basitarsis.

In the front wing, as Wesmael pointed out, the second intercubital cell is very short, being nearly quadrate but slightly narrowed anteriorly; first abscissa of radius as long as second; basal vein straight; nervulus twice its length from the basal, slightly oblique outwardly below; first brachial cell about 5 times as long as high; subdiscoideus emerging near posterior part of apex of first brachial cell and only slightly curved; second abscissa of cubitus as long as first intercubitus; second abscissa of cubitus and second intercubitus hyaline; stigma yellow to point of emergence of radius, then brown. In posterior wing radiellian very faint and slightly sinuate; radiellian cell about $2 \times$ as broad near apex as near base; mediella shorter than lower abscissa of basella, which in turn is nearly $2 \times$ as long as the diagonal abscissa; postnervellus present.

Relative lengths and widths of tergites in the depressed abdomen are as follows: 1—37:28 at apex, 2—35:35, 3—27:40, 4—7:20. Tergite 1 is about twice as broad at apex as at base and with a complete median carina; at apex with a depressed area on each side for about $\frac{1}{4}$ of apical width, then raised again to level laterally; spiracles located at anterior $\frac{1}{3}$ on small tubercles. Anterior corners of tergite 2 angularly truncated and forming a swollen cushion against which tergite 1 articulates mainly from above; median carina on tergite 2 fading out towards the suturiform articulation which is shallow centrally, becomes deeper laterally, is crenulate and practically straight. Tergites 1 and 2 irregularly rugoso-striate. Tergite 3 rugoso-reticulate and truncate posteriorly; with an apical, thin, striate margin which is the overlapping portion. Tergites 2 and 3 with indistinct lunulae. While only four segments are visible from above in the lectotype this condition is probably purely happenstance, i.e., the telescoping would appear to have no particular significance. Tergites 1, 2, and 3 with sharp lateral carina; 4 not carinate.

In the δ the eyes are larger and more emarginate; segment 2 of the labial palpus is somewhat expanded apically; eight abdominal tergites are visible; the lunulae are more evident and the posterior femora are relatively more slender. Tergite 1 is relatively more elongate and slender, being $2\frac{1}{3} \times$ as wide at apex as at base and $\frac{2}{3}$ longer than wide at apex. The antennae are uniformly testaceous and are slender.

Cystomastax Szépligeti

Szépligeti described *Cystomastax* in 1904 (Genera Insect. 22: 81), including only *Cystomastax macrocentroides* n. sp. δ from Peru. The original description of the species was erroneous in certain respects.

The maxillary palpi are 6 segmented instead of 5. Segments 3–5 are the swollen segments. The labial palpi are 4 segmented and it is segment 2 which is swollen. The propodeal spiracle is narrowly ovate.

Other features are: The occipital carina is complete above, not uniformly arched but with a central anteriorly projecting broad bay-like area being formed by the carina at the top. The ocelli are large,

diameter of lateral ocellus 13; ocellocular line 3; postocellar line 2; lateral ocellar line 3; ocelloccipital line 7; cicatrices present. Malar space is about $\frac{1}{10}$ of eye height. On the inner spur of the middle leg there is a peculiar pecten composed of strong chaetae which spirals about $\frac{1}{4}$ of the way around the inner spur. The chaetae are longest towards the base and become gradually shorter towards the apex. There are 10 of these chaetae in the holotype. The claws have a very broad basal truncated portion and are shorter than the arolium, being exceeded by the arolium by about the length of the "tine" of the claw. These features in combination with the very large, deeply emarginate eyes, the slender abdomen, the slender long legs make the genus quite distinct. Another feature which might be mentioned is that the hind coxa is nearly $3 \times$ as long as its greatest width, hollowed on the outer upper posterior half, with a ridge and tubercle above and to the front of the excavated area.

The holotype is in Budapest.

Megarhogas Szépligeti

This genus was also described by Szépligeti in 1904 (*Genera Insect.* 22: 83) for two species from Celebes. Of these the first, *M. longipes*, was designated as type by Viereck in 1914 (*Proc. U.S. natn. Mus.* 41: 293). *Megarhogas* was placed in synonymy with *Cystomastax* by Granger in 1949 (*Mem. Inst. scient. Madagascar A 2: 159*).

Examination of the holotype ♀ of *Megarhogas longipes* confirms the synonymy made by Granger. In the specimen there is good agreement with the features of *Cystomastax*. The abdomen is long and slender; the legs agree in shape, in claw structure, and in the presence of the pecten on the inner claw of the middle leg. The posterior tibial spurs are pubescent on the basal two-thirds, then naked, very slightly curved. The features of the hind coxa are similar. The palpi are broken. The major difference appears to be in the front wing, where the base of second abscissa of radius is a little thickened and first intercubitus is strongly curved, being concave externally.

In Tafel 3, fig. 26 Szépligeti presented a drawing of what was labelled "*Megarhogas luteus* Szépl." After comparing the type of *longipes* with the figure I have no doubt that "*luteus*" was an error which should have read "*longipes*." The features agree except that what appear to be tubercles at the apex of the first abdominal segment in the figure were really extraneous matter on the specimen. The wing pattern shows well in the figure, but the curvature of the intercubitus is more apparent on the specimen. In addition, the degree of clavateness of the abdomen is greater than it appears in the type, but one can quite readily see how the artist might have made the interpretation which he made.

Macrostomion Szépligeti

Macrostomion was briefly characterized by Szépligeti in 1900 (Természetr. Füzet. 23: 57) for the species *bicolor*. In his original description Szépligeti indicated that the maxillary palpi are very long. Actually they are only $\frac{1}{2}$ longer than the height of the head. Segments 3-5 of the maxillary palpi are relatively long and slender, the third being $3 \times$ as long as its greatest width, the fourth about $4 \times$ and the fifth nearly $5 \times$. The angular excavation of the occiput mentioned is approximately equal to the length of the ocellocapital line. The recurrent is nearly interstitial. The suturiform articulation is straight, dropping steeply on the anterior side and rising gradually to the level of tergite 3 and is crossed by numerous carinae.

This genus has been placed in synonymy with *Pelecystoma* and restored. *Macrostomionella* of Baker was synonymized with *Macrostomion* by Baltazar but it would appear that much analysis of character combinations and differences must be made before we will be in a position to set generic limits in many of the groups.

Macrostomion bicolor Szépligeti

Szépligeti described *bicolor* from two specimens which are housed in Budapest. Of these the one bearing the following labels is hereby designated as the lectotype: "N. Guinea Biro 96," "Friedrich-Wilh.-haven," "Macrostomion bicolor Szépl. Det. Szépligeti" and "Lectotype Macrostomion bicolor Szépl. R. D. Shenefelt '69."

In this ♀ the occipital carina is complete above and joins the hypostomal carina. The posterior tibial spurs are of the long curved naked type. The propodeum possesses what looks like a split longitudinal median carina with a narrow space between the ridges thus formed. In addition it has a pair of oblique grooves towards the sides which run from the base to the apex. These grooves lie above low smooth ridges in which the nearly round spiracles are located. Beneath (or outside) of each of these smooth raised ridges there is another groove. Both of the grooves are crossed by strong carinae towards the apex. The claws are simple and are about half as long as the arolia.

The mouth opening is large, its width equalling the distance between the anterior tentorial pits. The eye is also large and emarginated. The occipital carina is complete and just in front of the carina there is a rather flat ledge-like strip. The temples are bulging in profile as seen from above. Measurements of relative lengths are: Head width 54; head length 36; distance between anterior tentorial pits 15; distance between bases of mandibles at mouth opening 16; eye height 34; eye width 19; temple 10; across face at lower antennal fossa 28; across face at top of clypeus 24; malar space 6. Scrobe shallow, smooth. Cicatrices present in ocelli; dia. lateral ocellus 7; ocellocular line 5; posterior ocellar line 3; lateral ocellar line 8; ocellocapital line 9.

In the hind wing the radiellian is straight and the radiellian cell is neither narrowed nor broadened towards the apex. The postnervellus is absent. Eight tergites are visible in the abdomen. Tergite 1 is 15 wide at base, 35 at apex and

is 52 long, the spiracles are at 20. It is striato-rugoso-reticulate, with no sculpture in the hollows and the median carina complete. Tergite 2 is 44 long and 48 wide at apex. Tergites 2 and 3 are rugoso-punctate.

GENERA NOT BELONGING TO THE ROGADINAE

Acanthorhogas Szépligeti

Type: *Acanthorhogas setosus* Szépligeti

This is a typical doryctine. It has pegs (chaetobothria) on the anterior face of the front tibia (six, well-spaced). Also at the apex of the tibia on the same side there is a terminal transverse row of 5 or 6 teeth. The anterior claws are simple. The middle lobe of the mesothorax is high, vertical in front, deeply set off from the lateral lobes. The posterior coxa has a distinct tubercle anteriorly near the base. The features listed were obtained by examination of the lectotype female which is located in Budapest.

Brachycentrus Szépligeti

Type: *Brachycentrus minutus* Szépligeti.

Notes from the type female which is located in Budapest.

Cyclostome. Head margined with central portion above not margined, the carina on each side going up to about the level of the top of the eye as seen in side view. Anterior tibia with at least four chaetobothria. Posterior coxa not toothed or unusually projecting basally. Posterior tibial spurs short, straight, pubescent, not longer than width of apex of posterior tibia. Abdomen missing.

Since the specimen has the spine-like structures on the anterior tibia the genus should be transferred out of the Rogadinae—probably into Doryctinae.

Neoclinocentrus Szépligeti

Type: *Neoclinocentrus variegatus* Szépligeti.

This genus was placed in the Rhogadinae by Szépligeti and was stated to be like *Clinocentrus* except that the abdomen was club-shaped and not compressed in the ♀. It was separated from *Semirhytus* on the basis of the non-interstitial recurrent and the hardly perceptible suturiform articulation; from *Megarhogas* through the fact that "the eyes and ocelli touch each other while in *Megarhogas* they stand far apart."

There are two specimens bearing Szépligeti's determination labels and "Bolivia Mapiri" in the collection at Budapest. Examination of these showed that the genus must be placed in the Doryctinae as Marsh defines the subfamily.

In *Neoclinocentrus* there are chaetobothria on the anterior tibia. The

head is cyclostome with the clypeus being deflexed from mandible to mandible—actually deflexed out to at least the center of the mandible, i.e., mouth-opening not at all narrowed. Labrum concave anteriorly, triangular, with the apical half covered with fine, transverse, closely-spaced rugae. The occipital carina is complete above. The posterior coxae are toothed in front near the base. The suturiform articulation is almost non-existent.

Semirhytus Szépligeti

Semirhytus Szépligeti 1902 Természetr. Füz. 25: 54. Two species.

Type *Semirhytus filicornis* Szépligeti. Indicated by Szépligeti in 1904 when he transferred *crassicornis* to *Yelicones*, thus leaving only one species in *Semirhytus* (Genera Insect. 22: 82). Officially designated by Viereck 1914 (Bull. U.S. natn. Mus. 83: 133).

This genus was placed in Rhyssaloinae by Szépligeti when it was described in 1902 and in the Rhogadinae in 1904, where it has remained since. The five modern members are all Neotropical but Brues (1933 Bernstein-Forsch. 3: 48) included a representative from Baltic Amber. Examination of the type of *Semirhytus filicornis*, which is housed in the Hungarian National Museum at Budapest, indicates that the genus must be transferred to the Doryctinae.

In the type the clypeus is reflexed from mandible to mandible; the occipital carina is complete; the anterior tibia is equipped with chaetothria; and the posterior coxa has a tooth-like projection on the anterior side near the base.

Mesocentrus Szépligeti

Type: *Mesobracon crassipes* Szépligeti. Monobasic.

In 1900 Szépligeti (Természetr. Füz. 23: 56) included only *crassipes* in his new genus *Mesocentrus*, which he placed in the subfamily Rhogadinae. In 1902 (Természetr. Füz. 25: 61) he added the species *pusillus* and in 1904 (Genera Insect. 22: 83) he recharacterized the group and indicated its similarity to *Yelicones*. Viereck 1914 (Bull. U.S. Nat. Mus. 83: 92) listed the genus. This seems to have been all that has appeared regarding it.

In the original description Szépligeti indicated that he was basing the species upon a single female and a single male. The male has been lost. The female is designated as the lectotype by Dr. Papp and is stored in the Hungarian National Museum.

The lectotype is not a cyclostome. The eyes are distinctly hairy, with the hairs about as long as they are on the flagellum. The tarsi are as they are in *Yelicones* in general but the claws are not pectinate. The claws do have what appear at first glance to be long, strong bristles and

which at first give an impression of long slender pectination, but closer examination shows these to be hairs with a covering of "dust" or "dirt." On the middle leg the basitarsus is shorter than segments 2 + 3 combined and the terminal segment = 2 + 3 + 4. On the hind leg the basitarsus is as long as 2 + 3 + 4 and the terminal segment = 2 + 3 combined. On the front leg the basitarsus is a little longer than 2 + 3 but shorter than 2 + 3 + 4. On all legs the arolium is large. The mesonotum is flat above, with the notaulices present, shallow except anteriorly. The scutellum is flat, coriaceous and margined laterally. The propodeal spiracle is circular and the propodeum reticulate-rugose. In the forewing the first brachial cell is open and the second cubital cell is larger than is that shown by Fischer (1962 *Annali Mus. Civ. Stor. Nat. Giacomo Doria* 73: 72) for *Pectenopius sumatranus* and trapezoidal rather than forming a trapezium. The sternaulus extends completely across the mesopleuron and is crenulate-rugose. The prepectal carina is complete; the suturiform articulation fine, not crenulate, straight; spiracles of first tergite about $\frac{1}{4}$ of distance from base to apex. There are no chaetobothria on anterior tibiae.

In *Yelicones* the claws are definitely pectinate, the eyes are not hairy (except for the usual submicroscopic hairs on a few of the spaces between the facets); the mouth opening is cyclostome although not quite typically so—the clypeus not being reflexed as it is in Braconinae and most other cyclostomes. The labrum however is triangular and slightly concave on the anterior face and smooth.

Crassipes has the labrum not reflexed, cultriform, convex anteriorly, hairy and filling the space between the mandibles and the clypeus. The maxillary palpi are 6- and the labial palpi 4-segmented. The head is completely margined.

In *Yelicones* the propodeal spiracle is circular. In the anterior leg the last segment of the tarsus is as long as 1-4 together. In the middle leg the final segment is not quite as long as the preceding four. In the hind leg the basitarsus is longer than 2 + 3 + 4 and the final segment is shorter than 2 + 3.

I strongly suspect that Fischer's genus *Pectenopius* will prove to be the same as *Mesocentrus* judging from his description and the figures he has provided. In any case *Mesocentrus* cannot be placed with the Rogadinae unless the cyclostome feature is disregarded.